

Claims

What is claimed is:

1. A system for managing communications between one or more on-board modules connected to one or more on-board data links and one or more off-board systems connected to one or more off-board data links, the system comprising:

a first on-board module connected to a first on-board data link, wherein the on-board module and first on-board data link are located in a work machine;

a first off-board system connected to a first off-board data link, wherein the off-board module is remotely located from the work machine; and

a gateway embedded in the work machine including:

first and second interface means connecting the on-board data links and off-board data links respectively to the gateway,

a server application configured to perform, when executed by a processor, a server process based on a server request provided by at least one of the first on-board module and the first off-board system, and

a communications application configured to convert a data message from a first format to a second format based on a type of data link used by the gateway to transmit the data message,

wherein the gateway selectively executes the server and communication applications based on a type of request received by the gateway from one of the first on-board module and first off-board system.

2. The system of claim 1, wherein the gateway includes a Web server application configured to perform, when executed by the processor, a Web server process that provides access to a Web page maintained in the work machine to the first off-board system. and

wherein the gateway selectively executes the Web server application based on a type of request received by the gateway from one of the first on-board module and first off-board system.

3. The system of claim 1, wherein the first interface means includes a plurality of on-board data link ports each connected to respective ones of the on-board data links including the first on-board data link.

4. The system of claim 3, wherein the second interface means includes a plurality of off-board data link ports each connected to respective ones of the off-board data links including the first off-board data link.

5. The system of claim 1, wherein the first off-board data link is one of an Ethernet data link, an SAE standard serial data link, a wireless radio data link, and a wireless satellite data link.

6. The system of claim 1, wherein the first on-board data link is one of a proprietary data link and an SAE standard serial data link.

7. The system of claim 1, wherein the server application leverages the communication application to convert the request from the first format to a second format based on a type of data link used to transmit the request to a destination device.

8. The system of claim 7, wherein the destination device is at one of the first on-board module and the first off-board system.

9. The system of claim 2, wherein the Web page includes content reflecting information associated with the work machine.

10. The system of claim 9, wherein the request is a Web server request received from the first off-board system and includes a query for operations data associated with the work machine.

11. The system of claim 10, wherein the operations data is at least one of parameter identifier information, configuration data associated with the gateway, and status information associated with an operation of the work machine.

12. The system of claim 1, wherein the request is a server request including one of:

- a request to push information to one of the on-board modules;
- a request to push information to the gateway;
- a request to retrieve information maintained in one of the gateway or one of the on-board modules;
- a request to perform a configuration process associated with the work machine; and
- a request to send information, maintained by one of the gateway and one of the on-board modules, to at least one of an off-board system and a another one of the on-board modules.

13. The system of claim 1, wherein the work machine moves between, or within, a work environment and the request is generated by a second

work machine including a second gateway that communicates with the gateway over one of the off-board data links.

14. The system of claim 1, wherein the gateway is software embedded in an on-board module that controls one or more components of the work machine.

15. A method for managing communications in an environment including a work machine having one or more on-board data links connected to one or more on-board modules and a gateway and having one or more off-board data links connected to one or more off-board systems and the gateway, the method performed by the gateway comprising:

- receiving a request generated by a source device and transmitted on a first data link;

- selectively executing a server application based on the request, wherein the server application performs a server process;

- identifying a destination device associated with the request;
- configuring the request to a format compatible with the destination device;

- providing the formatted request to the destination device;

- receiving a response to the formatted request from the destination device;

- configuring the response to a format compatible with the first data link; and

- sending the response to a target device over the first data link,

- wherein the first data link is either one of the on-board data links and one of the off-board data links and the source device is either one of an on-board module and an off-board system.

16. The method of claim 15, wherein the destination device is one of a software process executing on the gateway, a memory device located in the gateway, one of the on-board modules, and one of the off-board systems.

17. The method of claim 15, wherein the destination device is connected to a second data link and configuring the request to a format compatible with the destination device includes:

configuring the request to a format compatible with the second data link.

18. The method of claim 17, wherein the configured request and the response are transmitted over the second data link.

19. The method of claim 17, wherein the second data link is either one of the on-board data links and one of the off-board data links.

20. The method of claim 15, wherein the response receiving, response configuring, and sending steps are skipped when the request does not require a response from the destination device.

21. The method of claim 15, wherein the target device is the source device.

22. The method of claim 15, wherein instead of the first data link, the target device is connected to a third data link and the method includes configuring the response to a format compatible with the third data link and sending the response to the target device over the third data link.

23. The method of claim 15, wherein the request is a server request including one of:

- a request to push information to one of the on-board modules;
- a request to push information to the gateway;
- a request to retrieve information maintained in one of the gateway or one of the on-board modules;
- a request to perform a configuration process associated with the work machine; and
- a request to send information, maintained by either one of the gateway and one of the on-board modules, to at least one of an off-board system and another one of the on-board modules.

24. The method of claim 15, wherein the off-board data links include data links selected from one or more of an Ethernet data link, an SAE standard serial data link, a wireless radio data link, and a wireless satellite data link.

25. The method of claim 15, wherein the on-board data links include data links selected from one or more of a proprietary data link and an SAE standard serial data link.

26. The method of claim 15, wherein the server application leverages a communication application to perform at least one of the configuring steps.

27. A method for managing communications in an environment including a work machine having at least one on-board data link connected to at least one on-board module and a gateway and having at least one off-board data link connected to at least one off-board system and the gateway, wherein the gateway maintains a Web page serviced by a Web server application, the method performed by the gateway comprising:

receiving a request generated by a first off-board system and transmitted on a first data link;

selectively executing the Web server application based on the request, wherein the Web server application generates content for the Web page based on the request and packages the content into a response message;

configuring the response message to a format compatible with the first off-board system; and

providing the formatted request to the first off-board system over the first data link,

wherein the Web page content includes information associated with the operation of the work machine and is updatable with information received from at least one of an on-board module and a second off-board system.

28. The method of claim 27, wherein the first off-board system executes a Web browser that generates the request and displays the content on a display device.

29. The method of claim 27, further including:

receiving a request to update the content in the Web page;
extracting information from the request;
updating the content of the Web page using the extracted
information; and
allowing subsequent responses to subsequent requests for the Web
page to include the updated content.

30. The method of claim 29, wherein the request to update the content is received from either one of the at least one on-board module and the at least one off-board system.

31. The method of claim 27, wherein the content includes at least one of work machine parameter identifier information, configuration data associated with the gateway, and status information associated with an operation of the work machine.

32. The method of claim 27, wherein the content includes work machine parameter identification information and the request includes a query for retrieving the parameter identification information.

33. A computer-readable medium including instructions for performing a method, when executed by a processor, for managing communications in an environment including a work machine having one or more on-board data links connected to one or more on-board modules and a gateway and having one or more off-board data links connected to one or more off-board systems and the gateway, the method performed by the gateway comprising the steps of:

receiving a request generated by a source device and transmitted on a first data link;
selectively executing a server application based on the request, wherein the server application performs a server process;
identifying a destination device associated with the request;
configuring the request to a format compatible with the destination device;
providing the formatted request to the destination device;
receiving a response to the formatted request from the destination device;
configuring the response to a format compatible with the first data link; and
sending the response to a target device over the first data link, wherein the first data link is either one of the on-board data links and one of the off-board data links.

34. A computer-readable medium including instructions for performing a method, when executed by a processor, for managing communications in an environment including a work machine having at least one on-board data link connected to at least one on-board module and a gateway and having at least one off-board data link connected to at least one off-board system and the gateway, wherein the gateway maintains a Web page serviced by a Web server application, the method performed by the gateway comprising the steps of:
receiving a request generated by a first off-board system and transmitted on a first data link;
selectively executing the Web server application based on the request, wherein the Web server application collects content from the Web page based on the request and packages the content into a response message;

configuring the response message to a format compatible with the first off-board system; and

providing the formatted request to the first off-board system over the first data link,

wherein the Web page content includes information associated with the operation of the work machine and is updatable with information received from at least one of an on-board module and a second off-board system.